Name: Date:

Polynomial Factoring solution (version 629)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 2x + 3 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(2) \pm \sqrt{(2)^2 - 4(1)(3)}}{2(1)}$$

$$x = \frac{-(2) \pm \sqrt{4 - 12}}{2(1)}$$

$$x = \frac{-2 \pm \sqrt{-8}}{2}$$

$$x = \frac{-2 \pm \sqrt{-4 \cdot 2}}{2}$$

$$x = \frac{-2 \pm 2\sqrt{2}\, i}{2}$$

$$x = -1 \pm \sqrt{2}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-2 + 8i$ and $-3 + 6i$ in standard form $(a + bi)$.**

Solution

$$(-2 + 8i) \cdot (-3 + 6i)$$

$$6 - 12i - 24i + 48i^2$$

$$6 - 12i - 24i - 48$$

$$6 - 48 - 12i - 24i$$

$$-42 - 36i$$

Polynomial Factoring solution (version 629)

3. **Write function $f(x) = x^3 + 6x^2 - 7x - 60$ in factored form. I'll give you a hint: one factor is $(x - 3)$.**

Solution

	1	6	-7	-60
3		3	27	60
	1	9	20	0

$$f(x) = (x-3)(x^2+9x+20)$$

$$f(x) = (x-3)(x+4)(x+5)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = -(x+8)^2 \cdot (x+5) \cdot (x+1) \cdot (x-4)^2$$

Sketch a graph of polynomial $y = p(x)$.